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House Prices and Local Taxes in the UK

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Abstract

In this paper, estimates of the effects of local domestic property taxes (rates) on local house prices are presented, and the effect of local taxes on owner-occupied dwelling prices is calculated for a number of English cities for the period up to 1990. The methods used enable estimation to be made of the effect of the introduction, during 1990, of the Community Charge or poll tax in England, when the local tax base was moved from housing consumption onto individual residency. It is estimated that the reform could have increased house prices by around 15 per cent and contributed substantially to house price inflation.

JEL classification: H71, R31.

I. INTRODUCTION

The place and importance of the housing market within the general economy of the UK is receiving growing attention (Miles, 1994; Meen, 1996; Muellbauer and Murphy, 1997). Much of this increased attention arises out of, and has, at least in part, aimed at an explanation for, the soaring house price inflation that occurred up to 1990. Discussion in this field has centred on and around wealth effects and the increasing financial liberalisation of the mortgage markets over the 1980s. There remains, however, in this context, a major, celebrated and

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conspicuous tax policy change during the period that has received only passing mention in the literature.[1] This policy change was the replacement of local domestic rates by the poll tax (properly, the Community Charge) in 1989–90.

There is ample theoretical and casual basis for belief that there is a relationship between the tax liability attached to the ownership and consumption of a durable asset and its market price. Up to April 1989 in Scotland, and April 1990 in England and Wales, local domestic taxes were raised through rates, an excise-like tax related to annual housing consumption, with liability falling on the household. Rates were replaced by the poll tax, which was a lump-sum payment system payable by individuals based purely upon local area residency and was independent of the amount of housing consumed. The removal of tax liability from a durable product will be expected to increase its asset value, and the period of change from rates to the poll tax coincided with the height of the housing price boom of the 1980s in the UK. Following public unrest, the poll tax was replaced, in 1993, by the council tax, which reintroduced a link to housing consumption levels. The period of the change back from the poll tax to the council tax coincided with a fall in the real price of housing.

Despite the potentially important implications of this local tax reform for the course of house price inflation, there exists little empirical evidence on the effects of these changes on the market price of housing in the UK. One pre-implementation estimate is Hughes (1988), who concluded that there might be 11–17 per cent increases in average house prices around the English regions.[2] The remaining literature on the economic analysis of these tax changes has concentrated almost exclusively on the relative distributional burden of their formal incidence (Smith, 1991; Giles and Ridge, 1993).

Empirically, one way of approaching the interaction of local taxes and house prices is to consider the degree of tax capitalisation, which measures the extent to which the burden of increased (reduced) future tax liabilities is shifted onto present owners in the form of lower (higher) current asset values. For the US, using aggregated data over a number of tax jurisdictions to compare mean house prices and mean local tax rates (for example, Oates (1969), Rosen (1982) and Wassmer (1993)) or using data at individual-dwelling levels (for example, Yinger et al. (1988) and Palmon and Smith (1998)), studies have found a wide range of values for the degree of tax capitalisation, but 'best-bet' estimates emerge at between 10 and 35 per cent. For the UK, Topham and Ward (1992) present an attempt at estimating the effects of local tax and expenditure on house prices.

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[1]'The controversy which has surrounded the change [from rates to poll tax] could hardly have been anticipated by analysts, or policy makers ... What is interesting, however, is how little serious analysis of the reform has been undertaken by the economics profession' (Greenaway, 1991, p. 575).

[2]Department of the Environment (1986) suggests, on little apparent evidence, that house prices might rise by 5 per cent.

The purpose of the current paper is to present a new empirical analysis of the interaction between local property tax levels and house prices in the UK. These estimates are then used to estimate the market price effects of the reforms of the local tax system in 1989–90. The results indicate that these tax reforms probably contributed substantially to the observed real house price changes of the period. The paper proceeds as follows. In Section II, a brief review of the different local tax regimes is presented, and the theory, empirical approach and data sources are introduced in Section III. The underlying empirical results are presented and discussed in Section IV, and Section V applies these results to obtain estimates of the effects of local tax reforms to house price inflation over the late 1980s. Section VI provides a summary and conclusion.

II. A BRIEF HISTORY OF LOCAL TAX FINANCE IN THE UK

> 'The rates are one of the highest and the worst taxes under which Englishmen and English industry have ever groaned.'
>
> (Trevelyan, 1907, p. 30)

The system of rates had had a venerable history in Britain until replaced in 1989 (Scotland) and 1990 (England and Wales). Rates were levied on both domestic and commercial property in a local area, and, by the 1980s, the system was applied in the following manner. In all areas, each property (domestic or commercial) was individually assessed on the basis of an 'annual rental value' and assigned a rateable value, which had been last updated for all properties in England and Wales in 1973. Each local authority determined the total amount it needed to raise from its own domestic and commercial ratepayers, and so determined a rate poundage, which expressed how much tax was to be paid per unit of rateable value. Normally, a lower per-unit tax was applied to domestic properties than to commercial, called domestic rate poundage. Thus, for each domestic property,

$$\text{Tax bill} = \text{Rates} = RV \times DRP$$

where RV is rateable value and DRP is domestic rate poundage. Formal incidence always lay with the household resident in the dwelling, and low-income households received rates relief through the housing benefit section of the benefit system.

The poll tax or Community Charge was introduced in England and Wales in April 1990, and a year earlier in Scotland, and was replaced throughout Britain in April 1993. The poll tax was levied on individual domestic residency rather than on property consumption, value or ownership. Briefly, the system worked by each local authority first determining the total amount it needed to raise from its own domestic residents. Dividing this total by the number of eligible adult

residents within the authority determined the poll tax per eligible resident. Primary liability to pay rested on the individual and was *independent* of either the property value of the occupied dwelling or the ability to pay of the resident. The larger the number of adults in the household, therefore, the more poll taxes the household faced. A small number of groups were allowed exemption and lowered liability, and low-income groups were able to get some tapered rebates through a rebate system. The introduction of the poll tax coincided with an increase in the total amount of local tax raised from the average household, which certainly heightened its already undoubted unpopularity.

The council tax replaced the poll tax in April 1993 and reintroduced a connection between property valuation and tax liability, whilst retaining a link between household size and liability. Briefly, in the council tax system, each domestic dwelling is assessed by market value (as at April 1991) and assigned to one band of an eight-band range. The *relative* tax payable by properties in each band relative to other bands was laid down. Given the total local domestic taxation to be raised by each local authority, and the number and distribution of properties within the locality over the tax bands, the whole range of tax liabilities is generated. A link with the poll tax was retained in that discounts for single-person households were made available, and other concessions and rebates were introduced. The average local tax liability of households was, at the same time, greatly reduced, which undoubtedly eased this new tax's passage.[3]

III. THEORY AND DATA

For an individual property, no-arbitrage conditions suggest that the current market price of a property must reflect the present value of the stream of services derivable from that property, allowing for the tax liabilities and value of local government services that attach:

$$(1) \qquad PP_{ijt} = \sum_{k=0}^{m} (R_{j,t+k} H_i - T_{ij,t+k} + E_{j,t+k}) / (1+r)^k$$

where subscript i refers to the individual property, subscript j to the location of the property, subscript t to the time period and subscript k to future periods, and m is the property lifetime. PP_{ijt} is the market price of the property; R_{jt} is annual rental return per unit; H_i is the quantity of housing in the dwelling; T_{ijt} is the annual total tax liability; E_{jt} is a measure of annual locally-provided public services; and r is the rate of discount. The formulation may be simplified by

[3]For the introduction of the council tax, around £5 billion was transferred from being raised from local taxation to being raised from VAT, which was increased by 2.5 extra percentage points. The percentage of local authority expenditure funded from locally-raised domestic taxation fell from around 25 per cent to about 15 per cent.

assuming an infinite property life and constant annual returns and that people expect the current stream of returns and taxes to continue into the future; thus

$$PP_{ijt} = (R_{jt}H_i - T_{ijt} + E_{jt})/r\ .$$

This formulation implies that complete capitalisation of taxes into capital value occurs for local property taxation. It may well be that less than 100 per cent of changes in the present value of future local tax liability or service provision become capitalised into current market price: for example, only where supply is perfectly elastic will capitalisation be complete. We therefore use the more general form

$$PP_{ijt} = (R_{jt}H_i - k_1T_{ijt} + k_2E_{jt})/r$$

or

$$PP_{ijt} = a_0(R_{jt}H_i) + a_1T_{ijt} + a_2E_{jt} \qquad (2)$$

where $a_0 = 1/r$, $a_1 = -k_1/r$ and $a_2 = k_2/r$. The parameters k_1 and k_2 measure the degree of capitalisation of tax and services into house prices, respectively.

The approach adopted in this paper proceeds from equation (2) to estimate the connection between tax payable and house purchase price under the rates system of local taxation. For owner-occupied properties, $R_{jt}H_i$ — the annual return from a dwelling — cannot be observed directly, so we use a number of physical characteristics ($\mathbf{X_i}$), including location and time variables, in its place. Adding a random error term, u_{ijt}, the model becomes

$$PP_{ijt} = a_0(\mathbf{X_i}) + a_1T_{ijt} + a_2E_{jt} + u_{ijt}\ . \qquad (3)$$

Problems arise in estimating equation (3), because T_{ijt} and u_{ijt} cannot be presumed to be independent, as required for direct estimation by ordinary least squares (OLS). This is because properties with, say, unexpectedly high purchase prices (and therefore positive u_{ijt}) because of unrecorded desirable dwelling features will tend to have rateable values (and therefore tax liabilities) above average. T_{ijt} and u_{ijt} will be positively correlated. Potentially serious econometric problems could arise were no account to be taken of this. One general method for tackling such problems is the method of instrumental variables (IV), and this is utilised here.[4]

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[4]In England and Wales, rateable values were based on 1973 valuations of annual rental value and therefore themselves depend upon physical characteristics. So

$RV_i = f(\mathbf{X_i}) = d_0\,\mathbf{X_i} + v_i$

Equation (3) also takes note that local expenditure levels by local authorities can also have effects on the desirability and price of individual dwellings benefiting from that expenditure. On the local expenditure side, under the UK system of local government finance, the link between the domestic revenues from locally-raised taxes and service expenditures for individual tax jurisdictions is not as direct as might be first imagined. For the UK, local government expenditures are only partially funded by local taxes paid on local domestic properties. The bulk of the financing of services is covered by direct grants from central government and by the local taxes paid by commercial, industrial and other properties. For the period covered in this research, the percentage of total local expenditure covered by rates on domestic properties was only about 25 per cent for London, and under 22 per cent for the other Metropolitan Counties. Indeed, the link was further attenuated as the rate support grant system, which determined central grant provision for the period under study, was explicitly constructed so that any locally-instigated increases in taxation were offset by reductions in grants available from central funds. Nevertheless, in order to avoid any endogeneity problems on the expenditure side, the service expenditure variable used in estimation was also instrumented.[5]

Data on house prices, dwelling rateable value and associated physical characteristics for individual properties come from the 5% Sample Survey of Building Society Mortgages, over the nine tax years from 1981–82 until 1989–90 (Department of the Environment, 1988). The 5% Sample Survey database

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where v_i is a random error term. We know that, under rates, tax paid is determined by rateable value and domestic rate poundage, so

$$T_{ijt} = RV_i \times DRP_{jt}$$

where *RV* is rateable value and *DRP* is domestic rate poundage. We may therefore obtain

$$T_{ijt} = (d_0 \mathbf{X_i} + v_i) \times DRP_{jt},$$

which suggests employing the product of the physical characteristics variables and domestic rate poundage, which will be uncorrelated with u_{ijt}, as part of the instrumental variable procedure.

The IV technique involves a two-stage process whereby any *endogenous* explanatory variables in the system (tax liability, T_{ijt}, and service expenditure, E_{jt}) are first separately regressed upon the *exogenous* variables within the system (including the set of $\mathbf{X_i} \times DRP_{jt}$, Grant Related Expenditure (GRE) and other variables). The predicted values for T_{ijt} and E_{jt} resulting are then used in the substantive second stage and standard-error calculations are appropriately modified. Only the results from the second stage of the IV estimation process are reproduced here. The use of OLS directly and inappropriately on equation (3) results in positive and significant coefficients on tax liability and an erroneous conclusion that increased tax liabilities lead to an increase in purchase price.

[5]The search for potential instruments correlated with local service expenditure per head but uncorrelated with local tax levels soon comes across Grant Related Expenditure (GRE) as a possibility. This was calculated by central authority as part of the rate support grant system which determined the amount of grant allocated to each local authority by central government. The GRE for an individual authority was aimed at providing a standard for assessing expenditure needs for the authority, based upon demographic and other factors. As actual or potential expenditure or rates revenue took no part in this calculation, GRE per head becomes a potentially good instrument for actual expenditure, and all estimates presented below come from procedures where GRE assessments are used as exogenous variables within the IV estimation procedure.

TABLE 1

List of Variables

Variable name	*Short description*
MARKET PRICE	
Real Purchase Price	Dwelling purchase price, deflated to April 1985 (£100s)
TAX VARIABLE	
TaxBill	Total tax bill: total local annual tax liability per household, deflated to April 1985 real value (£100s) (Instrumented)
EXPENDITURE	
Services	Services expenditure: total local annual expenditure on services per household, deflated to April 1985 real values (£100s) (Instrumented)
PROPERTY AGE (dummy variables)	
New Built	New property, first sale (excluded category)
Age-I	Built before 1919
Age-II	Built 1919–1939
Age-III	Built 1940–1960
Age-IV	Built 1961–1980
Age-V	Built after 1980, second-hand
PROPERTY TYPE (dummy variables)	
Bung	Bungalow
Detach	Detached house
Semi	Semi-detached house
Terraced	Terraced house (excluded category)
Flat-I	Flat or maisonette in converted house
Flat-II	Purpose-built flat or maisonette
NUMBER OF ROOMS (discrete variables)	
Rooms	Number of habitable rooms
Rooms^2	Square of number of rooms
Rooms^3	Cube of number of rooms
Garage	Property includes garage (dummy variable)
LOCATION DUMMIES	Dummies for location within Metropolitan Counties (see Appendix Table A.1 for key)
TIME DUMMIES	35 dummies for quarters

Note: All nominal values (purchase price, domestic rate poundage, expenditure) are deflated to April 1985 values using the non-housing-cost portion of the retail price index.

strictly identifies the location of observations down to a local-tax-setting jurisdictional level only for the six former English Metropolitan Counties plus Inner and Outer London, so the analysis is restricted to these eight housing markets. The information collected refers to individual new mortgages issued by building societies in the UK, and records data on the dwellings concerned as described in Table 1. As may be seen, the information on individual dwellings recorded there, whilst less than that ideally desired, provides a fair number of the most important relevant variables on physical characteristics to act as conditioning variables in the estimating equations below. Dummies for local authority areas will pick up area unobserved fixed effects.

The source of information on local authority finance is CIPFA (1981–91), which provides jurisdictional domestic rate poundages and measures of annual expenditure on services per tax year per household. Unlike local tax liability for dwellings, local authority service expenditure per household for an observation will be equal for all individual households observed in a particular local district during a given year.

The object of the empirical approach adopted is to identify the effects of rates on house prices from cross-section correlations of house prices and rates. As the observations used stretch over 36 quarterly periods from 1981 to 1990, 35 dummies representing particular quarters are utilised at all stages. Any effects common to all transactions observed for one quarter will be reflected in the parameter values attached to the dummy taking the value of unity for that quarter. These parameters will pick up both general rises in real house prices for the quarter and specific effects due to policy changes, such as the ending of double mortgage tax relief in August 1988. The quarterly time dummies may also pick up some of the effects due to the anticipation of the coming tax reforms following the announcements of the reforms in the Green Paper of 1986 (Department of the Environment, 1986).

IV. RESULTS

The substantive results of the model estimation are presented in Table 2. The coefficients on physical characteristics and location (multiplied by 100) are often interpreted as hedonic prices (£s) attached to the particular characteristic involved. In general, the signs and magnitudes derived seem reasonable and underline well-known characteristics of the UK housing market. The results presented are reasonably, if not perfectly, consistent over the eight metropolitan areas.

US studies have often found the expenditure side of local government processes to be important determinants of property values (for example, Mieszkowski and Zodrow (1989)). Given a tax liability, particularly beneficial and/or large applications on the expenditure side should be associated with

TABLE 2

Overall Tax Effects on Real Purchase Price: IV Estimation *(Dependent Variable: Real Purchase Price)*

	Merseyside		Tyne & Wear		South Yorkshire		West Yorkshire	
	Coeff.	*t-value*	*Coeff.*	*t-value*	*Coeff.*	*t-value*	*Coeff.*	*t-value*
TaxBill	–9.02	–2.22	–8.82	–2.01	–10.22	–3.25	–8.53	–3.11
Services	–1.78	–0.13	–29.21	–2.29	2.06	0.28	8.42	2.23
(New Built)								
Age-I	–18.07	–1.65	–50.22	–3.97	–14.19	–1.36	–3.52	–0.55
Age-II	–6.77	–0.69	–53.14	–4.35	–28.72	–3.00	–21.22	–3.55
Age-III	–35.70	–3.61	–91.91	–7.39	–57.42	–5.96	–30.78	–5.01
Age-IV	–25.61	–2.58	–62.77	–5.23	–26.58	–2.88	–11.83	–2.03
Age-V	–26.22	–2.02	–13.40	–1.01	–0.41	–0.04	31.51	4.13
(Terraced)								
Bung	170.51	16.32	83.05	10.58	173.63	26.61	115.82	19.80
Detach	230.97	22.73	157.76	13.86	155.41	21.78	165.28	24.90
Semi	76.32	16.73	37.29	7.28	52.94	14.37	45.32	13.33
Flat-I	40.25	2.59	–0.54	–0.06	5.26	0.30	52.68	4.04
Flat-II	34.13	2.84	–21.22	–4.15	26.48	2.51	40.04	3.96
Garage	86.61	16.28	88.83	18.09	68.79	19.73	72.69	23.35
Rooms	–17.52	–0.74	–30.70	–1.70	–90.76	–4.79	–43.57	–3.45
Rooms^2	4.29	1.14	8.47	2.97	15.96	5.31	10.23	4.78
Rooms^3	–0.09	–0.45	–0.36	–2.56	–0.57	–3.77	–0.37	–3.26
Constant	162.48	0.82	561.56	3.40	253.55	2.66	8.21	0.12
	Local authority district dummies		*Local authority district dummies*		*Local authority district dummies*		*Local authority district dummies*	
	MS2 32.43	0.77	TW2 131.83	3.03	SY2 –2.13	–0.32	WY2 9.35	1.93
	MS3 1.52	0.13	TW3 48.10	4.07	SY3 5.68	1.11	WY3 –4.20	–1.03
	MS4 32.20	0.82	TW4 49.62	2.61	SY4 44.36	2.23	WY4 39.60	6.52
	MS5 30.11	1.35	TW5 4.96	0.75			WY5 –24.21	–5.25
No. of obs.	2,878		2,377		3,763		4,750	
F	75.630		54.390		109.100		323.040	
R^2	0.591		0.559		0.609		0.611	
RMSE	82.993		72.522		71.375		77.507	

TABLE 2 continued

Overall Tax Effects on Real Purchase Price: IV Estimation *(Dependent Variable: Real Purchase Price)*

	West Midlands		Greater Manchester		Inner London		Outer London	
	Coeff.	*t-value*	*Coeff.*	*t-value*	*Coeff.*	*t-value*	*Coeff.*	*t-value*
TaxBill	–9.57	–2.05	–11.81	–4.98	–12.67	–2.41	–12.21	–2.18
Services	–13.08	–1.30	–6.90	–1.11	14.76	0.94	7.39	0.74
(New Built)								
Age-I	–20.25	–2.09	–45.21	–4.91	–101.58	–3.88	–45.91	–2.99
Age-II	–22.89	–2.67	–49.29	–5.60	–131.80	–5.10	–70.43	–4.88
Age-III	–22.66	–2.63	–64.57	–7.07	–195.67	–7.19	–147.92	–9.96
Age-IV	–17.15	–2.01	–46.26	–5.35	–158.95	–6.26	–94.84	–6.55
Age-V	–3.67	–0.36	–15.96	–1.60	–55.52	–1.86	–59.23	–3.78
(Terraced)								
Bung	196.61	15.73	150.73	24.39	38.42	0.54	167.41	11.31
Detach	215.67	23.28	206.79	31.24	177.81	7.23	269.23	26.29
Semi	52.95	12.62	66.28	18.74	70.99	6.15	69.36	13.93
Flat-I	–2.04	–0.16	36.99	2.24	–18.77	–1.81	–25.27	–3.95
Flat-II	–23.24	–3.30	29.37	3.67	–52.30	–5.57	–49.14	–8.90
Garage	73.86	17.78	58.37	19.00	115.18	11.00	112.08	22.35
Rooms	–37.79	–1.78	–91.49	–6.52	86.88	4.38	–8.87	–0.51
Rooms^2	5.88	1.68	16.82	7.47	–8.47	–2.62	5.50	1.79
Rooms^3	0.01	0.04	–0.61	–5.37	0.49	2.97	–0.06	–0.37
Constant	395.29	2.78	409.43	5.17	109.63	0.32	67.23	0.38

West Midlands			Greater Manchester			Inner London			Outer London		
	Coeff.	*t-value*		*Coeff.*	*t-value*		*Coeff.*	*t-value*		*Coeff.*	*t-value*
Local authority district dummies			*Local authority district dummies*			*Local authority district dummies*			*Local authority district dummies*		
WM2	3.39	0.62	GM2	–1.68	–0.21	IL2	–172.00	–2.38	OL2	225.59	4.59
WM3	–70.62	–2.41	GM3	59.02	1.76	IL3	–160.95	–4.84	OL3	138.14	2.96
WM4	–55.69	–7.29	GM4	0.15	0.03	IL4	–55.79	–1.53	OL4	195.02	9.88
WM5	33.32	1.12	GM5	14.07	1.45	IL5	–68.03	–1.84	OL5	180.73	3.26
WM6	–47.27	–5.87	GM6	5.99	0.73	IL6	46.47	0.71	OL6	165.76	3.62
WM7	–35.77	–3.44	GM7	35.66	3.63	IL7	–141.11	–4.30	OL7	186.54	6.77
			GM8	12.83	2.05	IL8	–176.16	–2.80	OL8	197.78	4.19
			GM9	43.11	4.44	IL9	–175.13	–6.62	OL9	181.35	6.25
			GM10	–26.97	–5.41	IL10	–263.72	–12.03	OL10	242.76	5.20
						IL11	–68.15	–0.89	OL11	185.93	3.92
						IL12	–27.44	–0.86	OL12	211.68	5.03
									OL13	192.12	7.65
									OL14	210.87	10.46
									OL15	239.16	4.91
									OL16	85.80	3.37
									OL17	210.03	3.93
									OL18	326.85	6.18
									OL19	209.44	3.95
									OL20	126.13	7.00
No. obs.	4,408		No. obs.	5,261		No. obs.	3,139		No. obs.	7,540	
F	123.330		F	141.930		F	80.660		F	170.750	
R^2	0.614		R^2	0.617		R^2	0.438		R^2	0.612	
RMSE	92.791		RMSE	77.436		RMSE	159.730		RMSE	140.700	

Notes to whole of Table 2: All equations include 35 quarterly dummy variables. Standard errors use White's method (White, 1980). See Appendix Table A.1 for key to districts. See Table 1 for key to variables.

higher property prices in such localities. Such effects were not found here. The coefficient attached to the instrumented expenditure variable (Services) carries a positive and significant sign only in a single instance. Generally, the coefficients on the expenditure variable are inconsistent and insignificant, and remained so over a number of alternative formulations attempted. The way that service expenditure figures remain invariant over households observed in the same locality at the same point in time will make it difficult to pick up such effects even if they exist, especially on top of location-specific and time-specific dummy variables.

However, the major focus of interest here relates to the coefficients attached to the tax variables included in the IV estimation of equation (3), and here the results are consistent and encouraging. These coefficients and their t-values have been extracted and collected in Table 3, where they are presented in the first column. All the coefficients are statistically significant, and they are all negative, as expected, showing higher housing prices where levels of rates payable are lower. All the coefficient values lie within the quite narrow range between –8 and –13.

As noted above, the degree of capitalisation of local taxes, measuring the proportion of the present value of the future stream of local tax liabilities that is incorporated into current asset price, is related to the magnitude of the

TABLE 3

Tax Effects Coefficients and Estimated Tax Capitalisation Rates

	Tax bill — coefficient (t-value)	*Implied rate of tax capitalisation (real discount rate = 3%) (%)*
Merseyside	–9.02	27.1
	(–2.22)	
Tyne & Wear	–8.82	26.5
	(–2.01)	
South Yorkshire	–10.22	30.7
	(–3.25)	
West Yorkshire	–8.53	25.6
	(–3.11)	
West Midlands	–9.57	28.7
	(–2.05)	
Greater Manchester	–11.81	35.4
	(–4.98)	
Inner London	–12.67	38.0
	(–2.41)	
Outer London	–12.21	36.6
	(–2.18)	

coefficients attached to the tax variables presented here. However, the extent of tax capitalisation, k_1, may only be extracted conditional on a known or assumed level of real discount rate. As we saw above,

$$k_1 = -(\hat{a}_1) \times r$$

where $\hat{a}_1$ is the estimated coefficient in Table 3. Consideration of returns on minimum-risk government debt and the level of expected inflation, centred on 1985, imply that the real rate of discount probably lies between 2 and 5 per cent. For the purposes of the exercise here, the real rate of discount, *r*, will be taken as 3 per cent, but the reader may easily substitute an alternative preferred value. The second column of Table 3 contains the estimates of the degree of tax capitalisation derived from the estimates for coefficients presented in the first column, for a 3 per cent real discount rate and the assumptions of expectations of unchanged future taxes and an infinite life for housing. As may be seen by inspection, the local tax capitalisation estimates here lie at and around 33 per cent, implying that about one-third of any changes in tax liabilities falling on housing are incorporated into house prices.

V. HOUSE PRICE INFLATION AND THE POLL TAX

It remains to use the results obtained above to estimate the effects on general housing prices resultant from the switch from rates to poll tax in 1990. The analysis here will consider rates as an *ad valorem* tax on housing and the poll tax as a lump-sum tax on residence. No account will be taken of the (probably small) income effects of the reform; and it is assumed there is no effect from the reform on local expenditure levels by local authorities. The exercise also has to maintain that individuals believed, at least at the time of its instigation, that the poll tax would remain a permanent reform of the local tax system.

Given that the poll tax moved the base for local taxation entirely from housing onto residency, and with capitalisation effects, the price of housing will increase. The estimation of the effects of the removal of rates, applying the results from Table 2, are contained in Table 4. These results use the appropriate figures and estimating equation for each metropolitan area taken one by one. The method takes the sample average (real) rates payable in tax year 1985–86, the central year for the study, as in column (1) of Table 4. Column (2) presents the estimated effect of these rates payable on the purchase price for the mean sample metropolitan dwelling for that jurisdiction. As may be seen, the central estimate is that the removal of rates on housing would increase sample house prices by between 10 and 17 per cent, as shown in column (3). Over the period from tax year 1985–86 until 1990–91, the actually-observed, *real* rates of house price inflation for the sample database for each metropolitan area were as presented in column (4). The final column shows that the simulation implies around 30 per

TABLE 4

Effect of Rates Removal on House Prices, 1985–90

	Mean household rates paid, 1985, real (£)	*Estimated effect on 1985 house price, real (£)*	*Effect as proportion of price, 1985*	*Actual real house price inflation, 1985–90*	*Proportion of inflation attributable to rates removal*
	(1)	(2)	(3)	(4)	(5)
Merseyside	434.3	3,921.8	+0.161	+0.521	0.309
Tyne & Wear	304.7	2,688.8	+0.125	+0.462	0.271
South Yorkshire	313.9	3,209.3	+0.152	+0.447	0.341
West Yorkshire	280.5	2,393.7	+0.102	+0.432	0.237
West Midlands	390.6	3,739.6	+0.146	+0.542	0.269
Greater Manchester	345.9	4,083.7	+0.171	+0.608	0.282
Inner London	471.1	5,968.5	+0.134	+0.310	0.432
Outer London	431.0	5,260.6	+0.117	+0.324	0.360

Notes: All figures are derived from sample. All figures in real 1985 terms.

cent of the real price increases of the period may, therefore, be attributable to the replacement of rates by the poll tax.

VI. SUMMARY AND CONCLUSION

This paper has sought to establish the extent to which the replacement of rates by the poll tax during 1990 contributed to the house price inflation of the late 1980s. Using an asset-pricing approach, a model and estimation procedure were described, which proved able to establish an inverse connection between the level of local rates liability and house price. With a large dataset, consistent and plausible estimates of the critical parts of the model were obtained, over eight large administrative jurisdictions for the period leading up to the tax reform. These results strongly support the proposition that local tax liabilities attached to housing are reflected in housing prices. Estimates were obtained for the degree of capitalisation into house prices of local tax under rates at around 33 per cent.

Given these empirical results, estimates may be made of the effects on the market price of housing of the introduction of the poll tax. Using the tax changes associated with the removal of the local tax on housing consumption, estimates indicated that around 10–17 per cent rises in the real price of housing may have been associated with the tax reform. The period in question saw substantial actual rises in the real price of owner-occupied housing in the UK. The estimates

here suggest that around 30 per cent of the observed rise in real house prices over the late 1980s may be attributed to the removal of rates payable on housing.

APPENDIX *follows References.*

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TABLE A.1

Key for Local Authority Dummies

Merseyside		*Tyne & Wear*		*South Yorkshire*		*West Yorkshire*		*Outer London*	
MS1	Knowsley	TW1	Gateshead	SY1	Barnsley	WY1	Bradford	OL1	Barking
MS2	Liverpool	TW2	Newcastle	SY2	Doncaster	WY2	Calderdale	OL2	Barnet
MS3	St Helens	TW3	North Tyneside	SY3	Rotherham	WY3	Kirklees	OL3	Bexley
MS4	Sefton	TW4	South Tyneside	SY4	Sheffield	WY4	Leeds	OL4	Brent
MS5	Wirral	TW5	Sunderland			WY5	Wakefield	OL5	Bromley
								OL6	Croydon
								OL7	Ealing
West Midlands		*Greater Manchester*		*Inner London*				OL8	Enfield
WM1	Birmingham	GM1	Bolton	IL1	Camden			OL9	Haringey
WM2	Coventry	GM2	Bury	IL2	Greenwich			OL10	Harrow
WM3	Dudley	GM3	Manchester	IL3	Hackney			OL11	Havering
WM4	Sandwell	GM4	Oldham	IL4	Hammersmith			OL12	Hillingdon
WM5	Solihull	GM5	Rochdale	IL5	Islington			OL13	Hounslow
WM6	Walsall	GM6	Salford	IL6	Kensington			OL14	Kingston
WM7	Wolverhampton	GM7	Southport	IL7	Lambeth			OL15	Merton
		GM8	Tameside	IL8	Lewisham			OL16	Newham
		GM9	Trafford	IL9	Southwark			OL17	Redbridge
		GM10	Wigan	IL10	Tower Hamlets			OL18	Richmond
				IL11	Wandsworth			OL19	Sutton
				IL12	Westminster			OL20	Waltham Forest

Notes: Key to abbreviations used in Table 2. In each Metropolitan County, the first district is the excluded district dummy variable.